

REMARKS

Reconsideration and allowance of this application are respectfully requested. Claims 1 and 3 have been amended. New claims 15-26 have been added. Claims 1-26 are now pending in the application. The rejections are submitted to be obviated in view of the remarks presented herein.

Rejection Under 35 USC § 112, Second Paragraph

Claims 1-10 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In response, the claims have been editorially amended. The claim modifications do not narrow the scope of the claims or raise new issues. Accordingly, the rejection of claims 1-10 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

Rejection Under 35 USC § 102 - Kawamura

Claims 1-4 and 9-12 have been rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Kawamura (U.S. Patent Number 4,507,685). The rejection is respectfully traversed.

Regarding claim 1, Applicant discloses an image processing method of performing a halftone dot processing in which first image data representative of pixel values of a plurality of pixels constituting an image is converted into second image data representative of dot patterns of halftone dots. In the present invention, a first dot% of dot patterns is different than a second dot% of dot patterns. The first dot% is observed when mutually contacting dot patterns first appear with respect to an identical direction on the image. The second dot% is observed when all the dot patterns which are adjacent to one another in the identical direction are in contact with

one another. In order to determine the first dot% and the second dot%, the pixel values are sequentially varied from a lower density end to a higher density end uniformly while performing dot processing.

Kawamura discloses an image recording device forming screen dot images by using a threshold value matrix, the representative example used by Examiner is shown in figures 11A, 11B and 12. In Kawamura, the threshold value matrix is generated by arranging thresholds in accordance with a count value. Kawamura's figure 6 illustrates an example of constructing one image element with a matrix consisting of 4×4 numbers of fine image elements. The numerical value for each of the fine image elements is a threshold value, which indicates a sequence of painting a corresponding fine image element. The matrix of fine image elements is a threshold value matrix. When a tone is reproduced by image element construction, the fine image elements are sequentially reproduced in the order of the numerical figures in figure 6, with seventeen gradations of brightness. Painting each fine image element is such that the colored portion is spread from the center of the matrix towards its surrounding in accordance with brightness of the image element (column 5, lines 14-34). Output data of image elements from a frame memory are compared by comparators with threshold data as configured in the threshold value matrix to create screen dots. Kawamura can expand from a 4×4 matrix size to an $L \times K$ matrix size by storing corresponding threshold value data corresponding to fine image elements in associated memory and navigating the $L \times K$ matrix by using horizontal and vertical address generating counters. Using the threshold value matrix of figure 6 generates the screen dot pattern image of figure 9. Figure 10A is a pattern derived from the threshold value matrix of figure 6 with the initial value of the horizontal counter subtracted from the preceding value one

by one for each line of each image element in the horizontal direction alone (column 7, lines 32-37). The image pattern for the threshold value matrix of figure 10A is shown in figure 10B.

Turning to figure 11A, a threshold pattern is shown where an initial value setting vertical counter setting is also counted up one by one in the vertical direction. The output screen dot pattern obtained from this count up is as shown in figure 11B (column 7, line 67 to column 8, line 3). The count value is used to change “n” in equation (2), which varies scanning angle. The exemplary embodiment shown in figure 11B and used by Examiner is a 4×4 matrix, whereupon the shapes of screen dots generated differ from position to position because the number of fine image elements are small (4×4). “When large numbers are taken for the fine image elements, e.g., a matrix construction of “8×8”, there will be no difference in the shape of the screen dots depending on their positions.” (column 8, line 65 to column 9, line 1). Kawamura obtains arbitrary screen angles of inclination in this fashion by changing the start position for reading of the threshold value matrix corresponding to one image element of an input stored in memory.

Kawamura’s example of a 4×4 matrix configured in a threshold value pattern diagram shown in figure 11A is of a horizontally and vertically shifted initial value setting, and incidentally shows a first dot% at 31.25% (Examiner’s Attachment A) and second dot% of 56.25% (Examiner’s Attachment B) due to its small sample size. This difference in first dot% and second dot% would not occur as such if the threshold value pattern diagram is expanded further than is currently shown in figure 11A, or if the matrix construction were to be expanded to 8×8 (column 8, lines 63 to column 9, line 1). With a larger matrix construction, the screen dots as shown in figure 11B would all have the same shapes, and thus adjacent dot patterns will always contact simultaneously at a determined dot%. Thus, as a first point of distinction, no first

dot% of dot patterns would then be distinguished from a second dot% of dot patterns as described in claim 1. Kawamura clearly teaches away from Examiner's representation in Attachments A and B using the sample of limited patterns of figure 11A. The sole object of Kawamura is to obtain an arbitrary screen angle by shifting the start position for reading the threshold value matrix from inputs stored in memory (column 9, lines 1-4). Even though varying the density in figure 11A shows a first dot% different than a second dot% within this depicted region of the threshold value pattern, this anomaly is created only due to the use of a small matrix, and a complete picture or larger matrix construction would show identically shaped screen dots susceptible to tone jumps during continuous shifts in image density. Therefore, Kawamura specifically teaches away from Applicant's claimed invention. Additionally, the screen dots in Kawamura are not even identical to one another in dot%. For example, the 4x4 matrix defined by threshold value "1" located in column 7, row 5 taken from the top left corner of figure 11A is missing a threshold value "13," and depending on interpretation, either has two "11s" or a missing "14" along with two "5s" as well as two "13s." Similarly, the matrix with "1" located in column 8, line 9 lacks a "2" and either a "14" or "15." Due to apparent ambiguities in the references it is impossible in Kawamura even to maintain a consistent dot% among dot patterns when density is varied. Thus, because dot% of dot patterns in Kawamura vary among the plurality of screen dots, there could not be any one dot% associated with dot patterns at any given density, with the screen dots varying in dot%.

Second, in the sole interpretation of the threshold value matrix in Kawamura where dot% would remain consistent among dot patterns, mutual contact of patterns would appear at 2/16 instead of 5/16. For example, in the 4x4 matrix defined by the threshold values of 2 (column 5,

row 9), 1 (column 8, row 9), 10 (column 8, row 12) and 6 (column 5, row 12), mutual contact with the dot pattern of the matrix immediately adjacent to the left would occur at 2/16 between the point of threshold value 2 (column 5, row 9) and threshold value 1 (column 4, row 10) of the adjacent matrix dot pattern. Examiner's reliance on 5/16 to describe this aspect would not be correct in this representation, since mutual contact occurs at 2/16 where dot 1 is disposed adjacent to dot 2.

Third, and relatedly, dot 3 and dot 4 subsequently fill to create a blocky effect that shows lack of uniformity and thus, as discussed above, the reference would have the same tone jumps as known fill patterns. By contrast, claim 1 recognizes that at a first appearance of mutual contact, uniform variation rather than blocked-simultaneous variation occurs. At least by virtue of the aforementioned differences, Applicant's claimed invention distinguishes over Kawamura. Applicant's claims 2-10 are dependent claims including all of the limitations of independent claim 1, which, as established above, distinguishes over Kawamura. Therefore, Kawamura does not anticipate claims 2-10 for at least the aforementioned reasons as well as for their additionally recited features. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(b) are respectfully requested.

With further regard to claim 2, this claim describes that thresholds of halftone patterns are adjusted. As discussed above, Kawamura shifts an initial value setting for a counter and does not adjust thresholds of halftone patterns. Kawamura merely changes the start position for reading of the threshold value matrix. At least by virtue of this additional difference as well as the aforementioned differences, Applicant's claimed invention distinguishes over Kawamura.

With further regard to claim 3, this claim describes that a first dot%-to-first dot% with respect to the mutually different direction, and a second dot%-to-second dot% with respect to the mutually different direction are mutually different. Again, Kawamura's example of a 4×4 matrix configured in a threshold value pattern diagram is shown in figure 11A, and incidentally shows a first dot%-to-first dot% at 37.5% (Examiner's Attachment C) and second dot%-to-second dot% of 62.5% (Examiner's Attachment D) due to its small sample size. This difference in first dot%-to-first dot% and second dot%-to-second dot% would not occur as such if the threshold value pattern diagram is expanded further than is currently shown in figure 11A, or if the matrix construction were to be expanded to 8×8 (column 8, lines 63 to column 9, line 1). With a larger matrix construction, the screen dots as shown in figure 11B would all have the same shapes, and thus adjacent dot patterns will always contact simultaneously at a determined dot%. Kawamura clearly teaches away from Examiner's representation in Attachments A and B using the sample of limited patterns of figure 11A. This anomaly created in this sample of Kawamura's threshold value pattern diagram is only due to the use of a small matrix, and a complete picture or larger matrix construction would show identically shaped screen dots susceptible to tone jumps during continuous shifts in image density. Therefore, Kawamura specifically teaches away from Applicant's claimed invention. At least by virtue of this additional difference as well as the aforementioned differences, Applicant's claimed invention distinguishes over Kawamura.

Regarding claim 11, Applicant's claimed invention is a corresponding apparatus of method claim 1, and is allowable over Kawamura for the same reasons as discussed above. Additionally, claim 11 recites that thresholds of halftone patterns are adjusted and stored in a halftone pattern storage unit. As discussed above, Kawamura does not adjust thresholds of

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halftone patterns. Kawamura merely changes the start position for reading of the threshold value matrix. At least by virtue of the aforementioned differences, Applicant's claimed invention distinguishes over Kawamura. Applicant's claim 12 is a dependent claim including all of the limitations of independent claim 11, which, as established above, distinguishes over Kawamura. Therefore, Kawamura does not anticipate claim 12 for at least the aforementioned reasons as well as for its additionally recited features.


Newly Added Claims

Claims 15-26 are newly added by this Amendment and are believed to be in condition for allowance.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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